The UAV **106** may authenticate the vehicle **102** using the optical target **128** attached to the vehicle **102**. The optical target **128** may comprise one or more lights configured to generate an optical pattern. The UAV **106** may authenticate the vehicle **102** if the generated optical pattern matches or corresponds to a predetermined pattern.

In some implementations, the UAV **106** may be configured to transmit data that indicates that the UAV **106** has additional energy which may be transferred. The transmitted data may also indicate a proposed cost for the additional energy. The vehicle **102** may transmit data to the UAV **106** indicating a request for the additional energy at the proposed cost.

FIG. **10** is a flow diagram illustrating a process **1000** of providing an energy request to a server **104** and receiving energy from a UAV **106**. Although the process **1000** is described with reference to the flowchart illustrated in FIG. **10**, many other methods performing the acts associated with the process **1000** may be used. For example, the order of the steps may be changed, some of the steps described may be optional, and additional steps may be included.

At **1002**, a device (e.g., the vehicle **102**) generates energy request data **116**. The device may comprise at least one of the vehicle **102**, surveillance equipment, communications equipment, or utility control equipment. In some implementations, the device generates the energy request data **116** in response to a determination that the energy source **110** is below a threshold energy storage level. In other implementations, the device generates the energy request data **116** in response to a determination that the device has an insufficient amount of stored energy to complete an operation. For example, where the device includes surveillance equipment, the surveillance equipment may determine that the energy level is an insufficient amount of energy to perform surveillance for the next 25 hours. In some implementations, the device generates the energy request data **116** in response to a user placing an order for additional energy.

The device may determine that a first amount of energy associated with the device is equal to or less than a threshold amount. In some examples, the threshold amount occurs when the energy associated with the energy source **110** is less than full, less than half full, or less than a quarter full.

In one example, where the device comprises the vehicle **102**, the vehicle **102** determines that the first amount of energy associated with the vehicle **102** is equal to or less than a threshold amount in response to a determination that the first amount of energy is insufficient to enable the vehicle **102** to move from a current location of the vehicle **102** to a recharging device location. The recharging device location may include locations such as a charging station at a commercial enterprise, a recharging unit located at the house of the vehicle's driver, a recharging unit located at a location of the driver's friend, and so forth. The vehicle **102** may determine that there is an insufficient amount of energy to convey the vehicle **102** to the charging device by analyzing the historical energy consumption data **114** and the vehicle location data **120**.

At **1004**, the device provides the energy request data **116** to the server **104**. Although in this example the device provides the energy request data **116** to the server **104**, in other examples, the device provides the energy request data **116** to the UAV **106**.

At **1006**, the device selects a first UAV **106** from a plurality of different UAVs **106**. The selection of the first UAV **106** may be based on a variety of factors, such as the distance between the UAVs **106** and the vehicle **102**, the cost of transferring energy, the amount of energy available, the type of energy available for transfer, and so forth.

At **1008**, the device docks with the first UAV **106**. The device may dock with the UAV **106** using any suitable mechanism such as the mechanisms illustrated in FIGS. **6** and **7**. At **1010**, the device receives the energy from the first UAV **106**.

Those having ordinary skill in the art will readily recognize that certain steps or operations illustrated in the figures above can be eliminated or taken in an alternate order. Moreover, the methods described above may be implemented as one or more software programs for a computer system and are encoded in a computer readable storage medium as instructions executable on one or more processors.

Embodiments may be provided as a computer program product including a non-transitory computer readable storage medium having stored thereon instructions (in compressed or uncompressed form) that may be used to program a computer (or other electronic device) to perform processes or methods described herein. The computer readable storage medium can be any one of an electronic storage medium, a magnetic storage medium, an optical storage medium, a quantum storage medium, and so forth. For example, the computer readable storage media may include, but is not limited to, hard drives, floppy diskettes, optical disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, flash memory, magnetic or optical cards, solid-state memory devices, or other types of physical media suitable for storing electronic instructions. Further, embodiments may also be provided as a computer program product including a transitory machine-readable signal (in compressed or uncompressed form). Examples of machine-readable signals, whether modulated using a carrier or not, include, but are not limited to, signals that a computer system or machine hosting or running a computer program can be configured to access, including signals transferred by one or more networks. For example, the transitory machine-readable signal may comprise transmission of software by the Internet.

Separate instances of these programs can be executed on or distributed across separate computer systems. Thus, although certain steps have been described as being performed by certain devices, software programs, processes, or entities, this need not be the case and a variety of alternative implementations will be understood by those having ordinary skill in the art.

Additionally, those having ordinary skill in the art readily recognize that the techniques described above can be utilized in a variety of devices, environments, and situations. Although the present disclosure is written with respect to specific embodiments and implementations, various changes and modifications may be suggested to one skilled in the art, and it is intended that the present disclosure encompass such changes and modifications that fall within the scope of the appended claims.

What is claimed is:

1. A system comprising:

a vehicle including a rechargeable battery and an optical target, wherein the vehicle is configured to:

determine that an amount of energy in the rechargeable battery is equal to or less than a threshold amount, wherein the threshold amount represents an amount of energy needed for the vehicle to reach a designated destination;

generate a request for energy; and

provide the request to a server;